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Patent Office
Canberra

I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004903882 for a patent by MOBILE REFRIGERATED AIR PTY LTD as filed on 15 July 2004.



WITNESS my hand this
Fifth day of May 2005

A handwritten signature in black ink, appearing to be 'LM' or similar initials.

LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
AND SALES

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION

**Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH
UNIVERSAL BASE (Front Load & Top Load)****The invention is described in the following statement:**

This invention relates to a collapsible refrigerated display case with universal base refrigeration module which can be easily configured (assembled/disassembled) as either a front load or top load display case as required for the application. The assembly is capable of maintaining a medium refrigerated space temperature (above product freezing) but not limited. A low refrigerated space temperature with alternative refrigeration component specifications including a defrost mechanism is optional.

Front Load Display Case Configuration:

The universal base refrigeration module (i.e. fabricated/moulded) is partitioned into two zones (High Temperature & Low Temperature) with airflow & ventilation paths and thermally insulated between the two. The base assembly open face is sealed by a lid (i.e. fabricated/moulded) comprising an integral seal mechanism located around the upper face perimeter (channel) including integrated ducts/vents (return & supply air). The base assembly houses a vapour compression refrigeration system comprising the following components, in the High Temperature Zone: a compressor, a condensate drain tray with coil (to contain/evaporate water condensate & de-superheat compressor discharge vapour), a heat rejection assembly (condenser coil with fan), a filter drier, a refrigerant control mechanism and in the Low Temperature Zone: a heat sink assembly (evaporator coil with fan), accumulator and temperature control. All refrigeration cycle components are in fluid communication with each other (via plumbing).

Hinged thermally insulated side panels (i.e. fabricated/moulded) with mitred (i.e. 45°) corners including seal mechanism in a concertina configuration are designed to collapse & open to form a 90° angular ('U') shape. The horizontal top & bottom end surfaces interface & seal against the refrigeration base & lid mating surfaces (channels). The inner side walls have several parallel rails designed to support removable product display shelving. The open face inner side wall edges each have vertical square edged rails designed to interface with the door assembly side channels

**Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH
UNIVERSAL BASE (Front Load & Top Load)**

A perforated panel duct (i.e. fabricated/moulded) located around the discharge air vent and rear panel inner face is designed to uniformly distribute refrigerated air

Several wire shelves are positioned as required on parallel inner panel support rails

The front load door assembly frame comprises two vertical side members with 'U' channels which interface (slide into) with the side panel vertical square edged rails. Top & bottom cross members (rectangular) interface with the base & lid mating surfaces (channels). A removable hinged sealed door with insulated transparent window (single/multiple air cavity) is attached to the frame to allow for product view & access.

The lid (i.e. fabricated/moulded) is a thermally insulated housing with integral seal mechanism located around the lower face perimeter (channel).

Top Load Display Case Configuration:

The universal base refrigeration module (i.e. fabricated/moulded) is partitioned into two zones (High Temperature & Low Temperature) with airflow & ventilation paths and thermally insulated between the two. The base assembly open face is sealed by a lid (i.e. fabricated/moulded) comprising an integral seal mechanism located around the upper face perimeter (channel) including integrated ducts/vents (return & supply air). The base assembly houses a vapour compression refrigeration system comprising the following components, in the High Temperature Zone: a compressor, a condensate drain tray with coil (to contain/evaporate water condensate & de-superheat compressor discharge vapour), a heat rejection assembly (condenser coil with fan), a filter drier, a refrigerant control mechanism and in the Low Temperature Zone: a heat sink assembly (evaporator coil with fan), accumulator and temperature control. All refrigeration cycle components are in fluid communication with each other (via plumbing).

Hinged thermally insulated side panels (i.e. fabricated/moulded) with mitred (i.e. 45°) corners including seal mechanism in a concertina configuration are designed to collapse & open to form a rectangular shape. The horizontal top & bottom end surfaces interface & seal against the refrigeration base & lid mating surfaces (channels).

A perforated panel duct (i.e. fabricated/moulded) located around the discharge air vent and rear panel inner face is designed to uniformly distribute refrigerated air

The top load lid housing (i.e. fabricated/moulded) with integral seal mechanism located around the lower face perimeter (channel) interface with the insulated side panels. A removable hinged sealed lid (i.e. fabricated/moulded) with insulated transparent window (single/multiple air cavity) is attached to the housing to allow for product view & access.

<p>Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH UNIVERSAL BASE (Front Load & Top Load)</p>
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The base refrigeration module may be powered off any suitable power source, such as Alternating Current (AC): (i.e. 240VAC 50Hz or 115VAC 60Hz) & Direct Current (DC): (i.e. 12 to 48VDC)

The refrigerated display case may be manufactured (i.e. fabricated/moulded) from any suitable material, such as metals, polymers or composites.

The insulation may be manufactured (i.e. moulded) from any suitable material, such as polymers or composites.

The seal mechanism may be manufactured (i.e. extruded) from any suitable material, such as rubber/synthetic type compounds.

The hinge mechanism may be manufactured from any suitable material, such as metal, polymer, composite or elastic type compounds.

The latch mechanism may be manufactured from any suitable material, such as metal, polymer, composite or elastic type compounds.

The tie strap mechanism may be manufactured from any suitable material, such as metal, polymer, composite or elastic type compounds.

The collapsible side panel assembly outer faces may have provision for advertising, such as moulded/fixed channels/grooves on outer edges as required to locate and support bill boards (i.e. printed fibreboard/plastic sheet).

Background:

There is an immediate need for temporary refrigerated storage space in the commercial retail industries. Commercial refrigeration units are usually designed as permanent storage and not intended for use as portable/transportable devices.

There is also a need for promotional/temporary refrigerated space to be provided for efficiently & economically (i.e. without the need for special materials handling equipment due to size/weight restraint); such as in collapsible forme, being transportable consuming minimal storage volume and with ease of assembly/disassembly.

This invention will contribute significant improvements in the availability of temporary/short term refrigerated storage space such as:

In Retail Stores:

- Product Promotions
- Point of Sale Purchasing

Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH UNIVERSAL BASE (Front Load & Top Load)

Some Other Applications:

- Corporate Functions
- Field Events
- Venues

The advantages of this type of refrigeration display case are as follows:

- High visibility advertising and marketing tool
- Reduced Premium Costs (i.e. short term refrigerated space substituted with the utilization of standard floor space)
- Collapsibility (i.e. utilizes maximum shipping volume, use of smaller vehicles)
- Portability (Occupational Health & Safety issues addressed i.e. components of assembly moved at ease due to partial weight & reduced physical size)
- Materials Handling Equipment (no need for specialized equipment)

The collapsible refrigerated display case assembly (Top Load) comprises the following main components:

- Universal Base Refrigeration Module
- Collapsible Side Panel Assembly (rectangular)
- Perforated Panel Duct (Top Load)
- Lid Assembly (Top Load)

The collapsible refrigerated display case assembly (Front Load) comprises the following main components:

- Universal Base Refrigeration Module
- Collapsible Side Panel Assembly ('U' Shape)
- Perforated Panel Duct (Front Load)
- Shelving
- Door Assembly
- Lid Assembly (Front Load)

A typical application follows (Front Load):

- The Universal Base Refrigeration Module is positioned on the required floor space
- A Collapsible Side Panel Assembly ('U') is opened to form a right angular shape and located around the Universal Base Refrigeration Module interfacing seal mechanism perimeter
- A Perforated Panel Duct (Front Load) is positioned around the supply air vent
- Wire Shelves are located on horizontal inner sidewall rails as required

<p>Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH UNIVERSAL BASE (Front Load & Top Load)</p>
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- A Door Assembly slides over vertical inner sidewall rails located at open face and the top and bottom door assembly cross members interface with the Universal Base Refrigeration Module and Lid Assembly (Front Load) interfacing seal mechanism perimeter
- A Lid Assembly (Front Load) is positioned on the Collapsible Side Panel Assembly ('U' Shape) interfacing with the seal mechanism perimeter
- The assembly may be secured with latch & strap type mechanisms
- The assembly is loaded with product
- The Universal Base Refrigeration Module is plugged into a suitable power source

A typical application follows (Top Load):

- The Universal Base Refrigeration Module is positioned on the required floor space
- A Collapsible Side Panel Assembly (rectangular) is opened to form a rectangular shape and located around the Universal Base Refrigeration Module interfacing seal mechanism perimeter
- A Perforated Panel Duct (Top Load) is positioned around the supply air vent
- A Lid Assembly (Top Load) is positioned on the Collapsible Side Panel Assembly (rectangular) interfacing with the seal mechanism perimeter
- The assembly may be secured with latch & strap type mechanisms
- The assembly is loaded with product (or stackable wire basket filled with product)
- The Universal Base Refrigeration Module is plugged into a suitable power source

Principal of operation:

Prior to refrigeration product loading

- The Vapour Compression Refrigeration System is run off a suitable power source & the refrigerated space is preconditioned by the removal of heat down to the desired storage temperature.

Refrigeration Capacity

- The Universal Base Refrigeration Module has sufficient capacity to cool product and maintain a desired storage temperature
- An Evaporator Refrigeration Coil sensor cycles in/out the Vapour Compression Refrigeration System to maintain refrigeration cooling capacity

In other embodiments of the invention the refrigeration cooling capacity can be maintained by other types of refrigeration system.

<p>Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH UNIVERSAL BASE (Front Load & Top Load)</p>
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Methods of Power Source:**Power Grid**

- Mains Power

Stand Alone

- Solar (Photovoltaic)
- Wind Generator
- Hydro Generator

Integrated

- Fuel Cell (Hydrogen)
- Battery Cell

Prior Art Systems:

There are no known collapsible refrigerated display cases of this type

To further assist with understanding the invention, please reference the accompanying information:

A) Illustrative Diagrams (Front Load)

Illustrative diagrams are shown in various configurations:

Diagram 1. (Dwg No. CRDC-001)

Illustrates an isometric assembly of the Collapsible Refrigerated Display Case (Front Load) complete with section, front, side & top view elevations including phantom views of internal components and tentative external dimensions

Diagram 2. (Dwg No. CRDC-002)

Illustrates a Collapsible Refrigerated Display Case (Front Load) assembly exploded view diagram including component labels

<p>Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH UNIVERSAL BASE (Front Load & Top Load)</p>
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B) Illustrative Diagrams (Universal Refrigeration Module Base)

Illustrative diagrams are shown in various configurations:

Diagram 3. (Dwg No. CRDC-003)

Illustrates an isometric assembly of the Universal Refrigeration Module Base complete with section, front & top view elevations including phantom views of internal components, tentative external dimensions and component labels

C) Illustrative Diagrams (Top Load)

Illustrative diagrams are shown in various configurations:

Diagram 4. (Dwg No. CRDC-004)

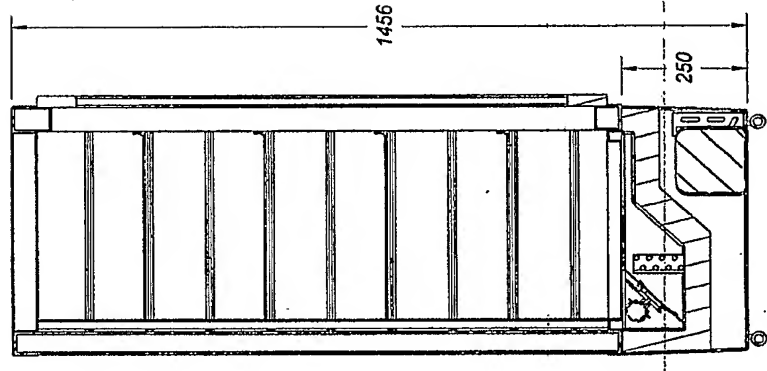
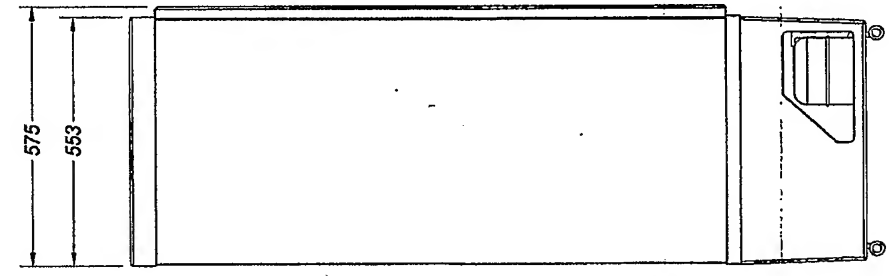
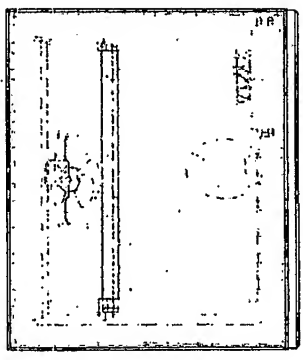
Illustrates an isometric assembly of the Collapsible Refrigerated Display Case (Top Load) complete with section, front, side & top view elevations including phantom views of internal components and tentative external dimensions

Diagram 5. (Dwg No. CRDC-005)

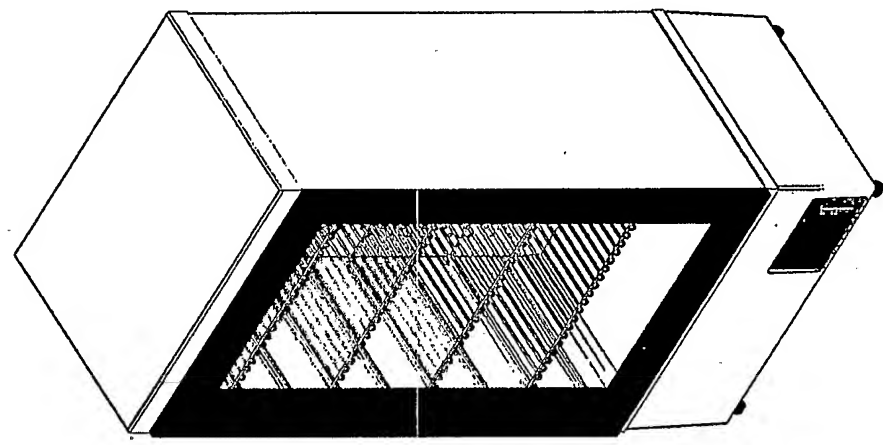
Illustrates a Collapsible Refrigerated Display Case (Top Load) assembly exploded view diagram including component labels


<p>Invention Title: COLLAPSIBLE REFRIGERATED DISPLAY CASE WITH UNIVERSAL BASE (Front Load & Top Load)</p>
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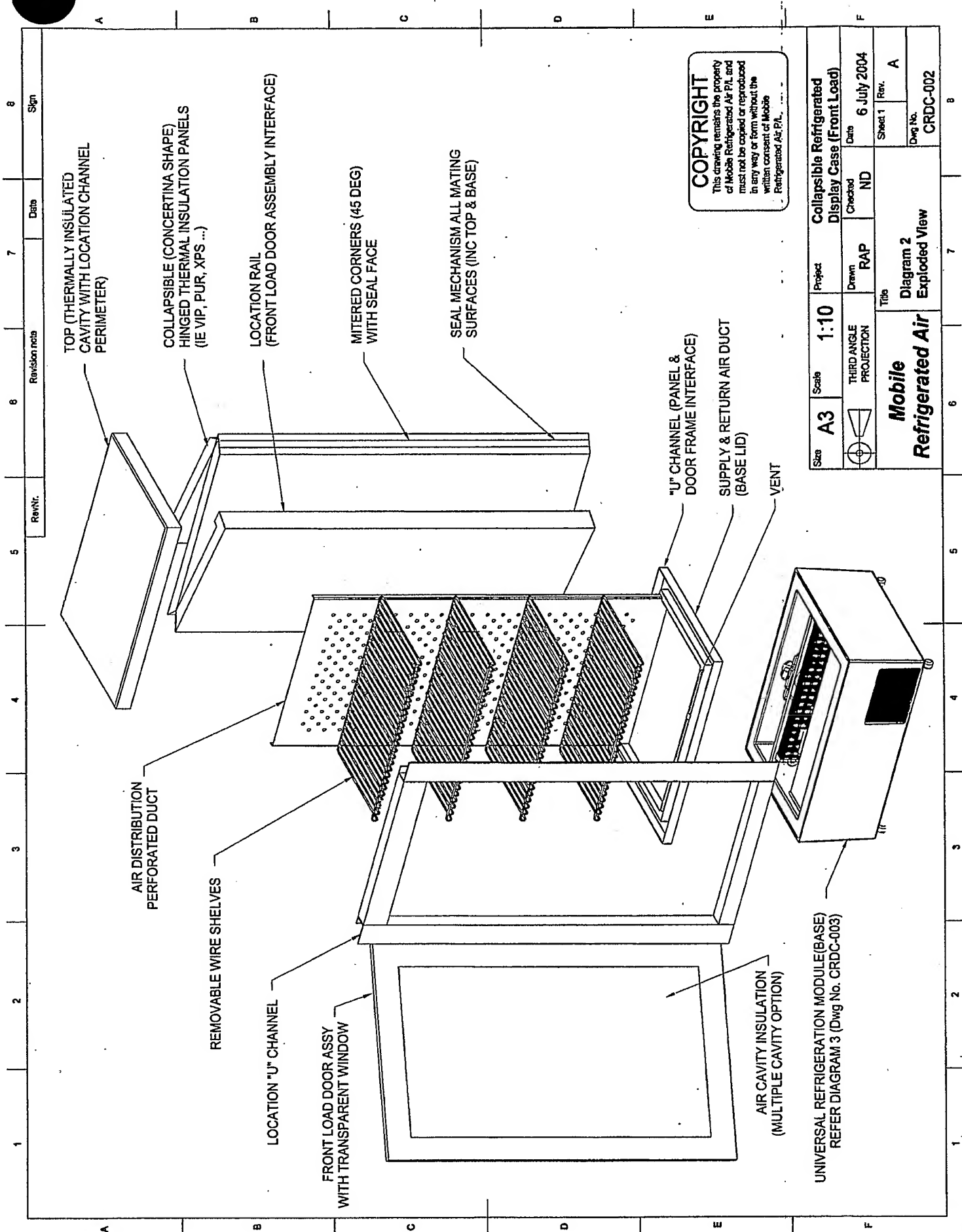
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Section A-A



Size	A3	Scale	1:10	Project	Collapsible Refrigerated Display Case (Front Load)		
	THIRD ANGLE PROJECTION	Drawn	RAP	Checked	ND	Date	6 July 2004
						Sheet 1	Rev. A
Mobile				Diagram 1			
Refrigerated Air				General Arrangement			
				Dwg No. CRDC-001			



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Size	A3	Scale	1:10	Project	Collapsible Refrigerated Display Case (Front Load)
THIRD ANGLE PROJECTION	Drawn	RAP	Checked	ND	Date
Title		6 July 2004			
Mobile Refrigerated Air		Diagram 2		Sheet 1	Rev. A
Exploded View		Dwg No.		CRDC-002	

UNIVERSAL REFRIGERATION MODULE (BASE)
 REFER DIAGRAM 3 (Dwg No. CRDC-003)

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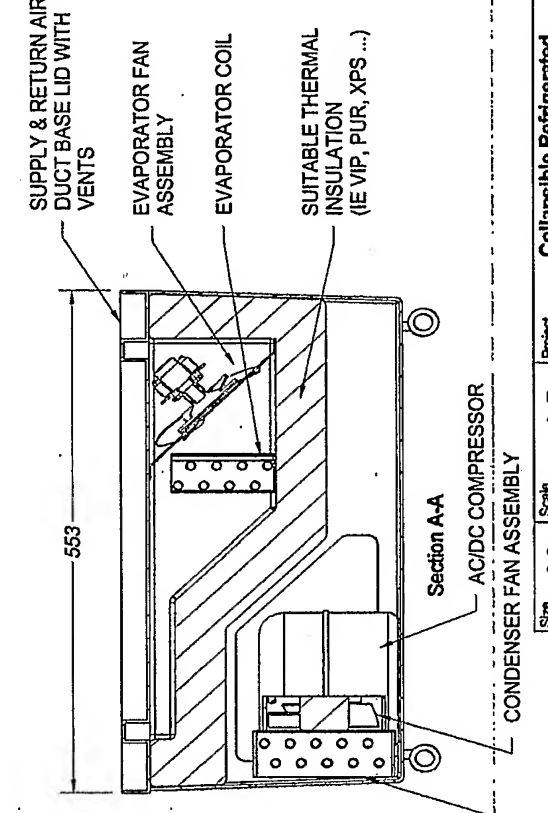
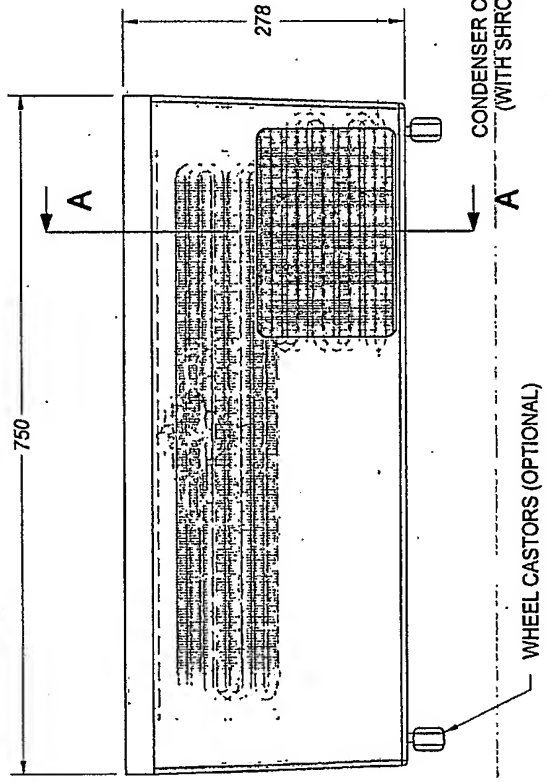
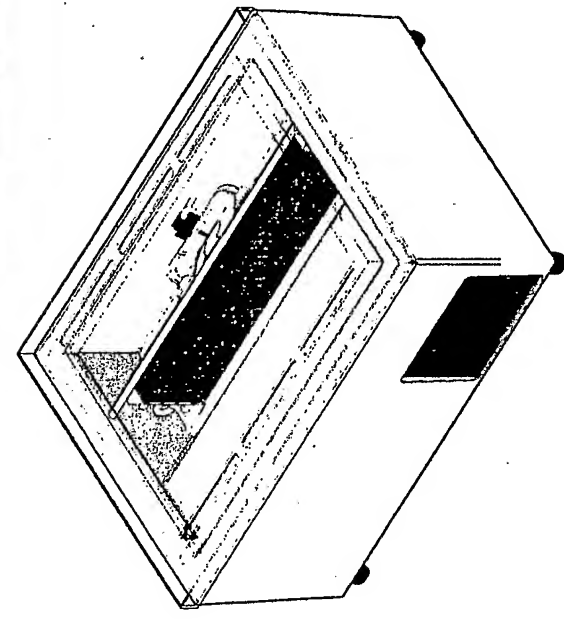
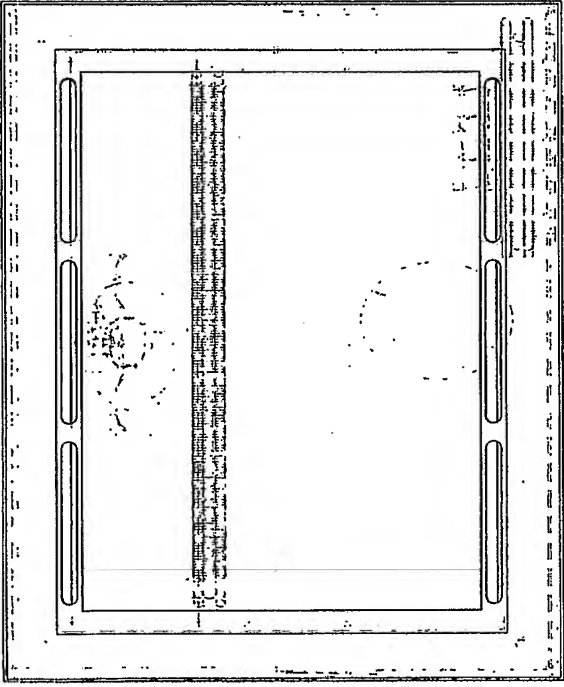
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Date

Revision notes

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Size	Scale	Project	Collapsible Refrigerated Display Case	Checked	Date
A3	1:5	Diagram 3	ND	6 July 2004	Rev. A
THIRD ANGLE PROJECTION		Drawn	RAP	Sheet 1	Rev. A
Mobile Refrigerated Air		Universal Refrigeration Module Base		CRDC-003	

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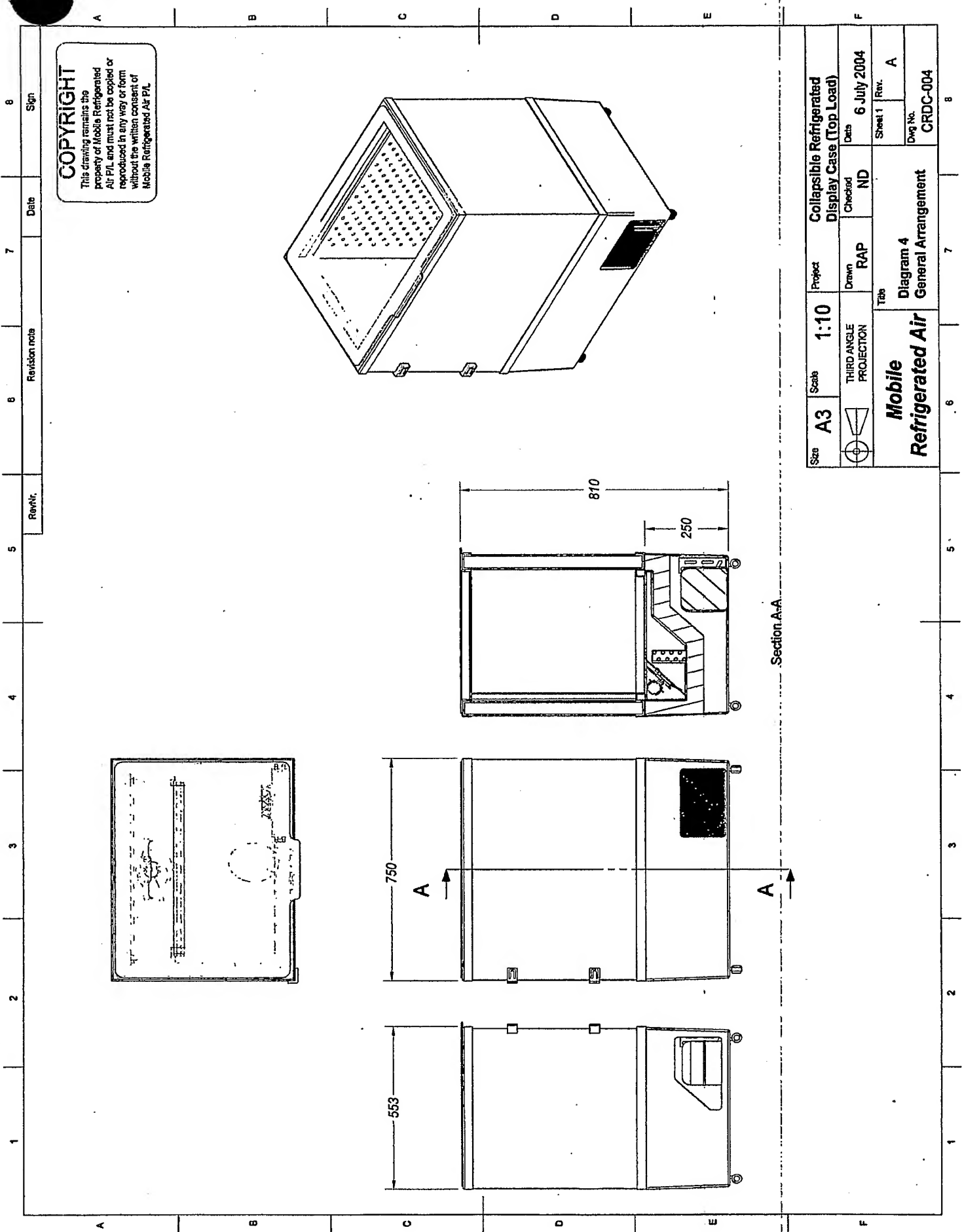
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Sign

Date

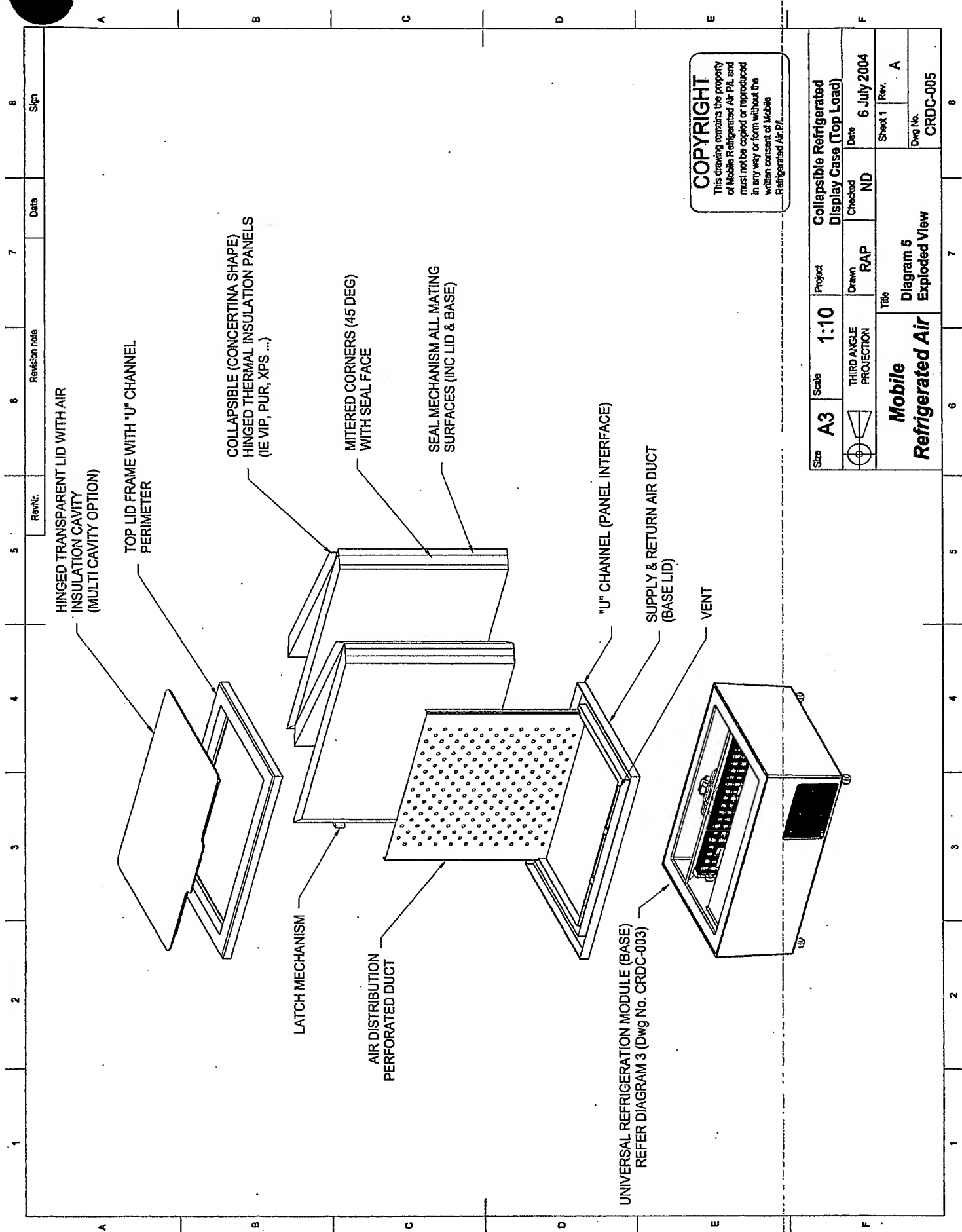
Revision note

Rev't


Size	A3	Scale	1:10	Project	Collapsible Refrigerated Display Case (Top Load)		
		THIRD ANGLE PROJECTION		Drawn	RAP	Checked	ND
						Date	6 July 2004
						Sheet 1	Rev. A
						Dwg No.	CRDC-004

Mobile Refrigerated Air

Diagram 4
General Arrangement



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Size	A3	Scale	1:10	Project	Collapsible Refrigerated Display Case (Top Load)		
		THIRD ANGLE PROJECTION		Drawn	Checked	Date	
				RAP	ND	6 July 2004	
Mobile Refrigerated Air		Title					
		Diagram 5					
		Exploded View					
		Dwg No.					
		CRDC-005					